

ABSTRACT

PROTECTOR FOR AN OPTICAL FIBER PROBE

The invention presents modifications of a protector design for an optical fiber probe intended for studying an object. The object being studied can be a biological tissue, namely, a biological tissue of a living body, for example, an internal cavity of a living body. The invention ensures an effective optical contact between an end face of a distal part of the optical fiber probe and the object being studied. In a preferred embodiment the later is achieved by designing an inner surface of a protector window capable of forming a temporary adhesive contact with the end face of the distal part of the optical fiber probe under a pressure of an axial force exerted on the optical fiber probe placed inside a sheath. Herewith, an outer surface of the protector window is designed capable of forming a temporary adhesive contact with the object being studied under the pressure of the axial force exerted on the optical fiber probe placed inside the sheath. To accomplish this in one embodiment the protector window is made of a pliable and resilient material, for example, of a cured optical gel. In another embodiment the protector window is configured as at least a bilayer structure. Additionally, in a preferred embodiment the layers, one of whose surfaces form either the inner or the outer surface of the protector window, are made of a pliable and resilient material, such as a cured optical gel. This prevents the protector window from sliding over the surface of the object being studied and at the same time ensures an effective optical contact between the end face of the distal part of the optical fiber probe and the object being studied. The cured optical gel can be jelly-like or rubber-like. The values of the refractive indexes of the protector window material at the operating wavelength or at least of the layer facing the interior cavity of the sheath and of the layer, one of whose surfaces forms the outer surface of the protector window, are chosen taking into account the values of refractive indexes of the distal part of the optical fiber probe and of the object being studied.